

Agrotechnical factors of the nutritional values in medicinal herbs

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Introduction

Growing, processing and trading medicinal and aromatic plants is considerable in Hungary, and the importance of their growing will probably continue increasing due to agricultural structures, the European Union rules and as a result of climate change. Within the products of agricultural origin, the share of ones used for medical and health, nutrition supplementary, living quality improving and other special purposes is constantly increasing and will rise both in absolute and relative senses. The environment and nature conscious farming and each related change of the legal and support system require new production strategies, and medicinal herb growing may be one of these changes. The plant species to be tested are widely known medicinal herbs all over the world. Demand for a wide variety of wild species is increasing with growth in human needs, numbers and commercial trade. With the increased realization that some wild species are being over-exploited, a numerous agencies are recommend that wild species should be brought into cultivation systems (Lambert et al., 1997; Tarnawa et al., 2013). Medicinal plant production through cultivation, for example, can reduce the extent to which wild populations are harvested, but it may also lead to environmental degradation and loss of genetic diversity as well as loss of incentives to conserve wild populations (Anon 2002). The number of plant species used for medicinal purposes is more than 50 000 (Govaerts 2001; Groombridge and Jenkins 2002). More than 400 plants species used for production of medicine by the Indian herbal industry, fewer than 20 species are currently under cultivation in different parts of the country (Uniyal et al., 2000). In China, about 5 000 medicinal plants have been identified and about 1 000 are more commonly used, but only 100–250 species are cultivated (Xiao Pei-Gen 1991). In Hungary, a country with a long tradition of medicinal and aromatic plant (MAP) cultivation, only 40 species are cultivated for commercial production (Bernáth 1999). In Europe as a whole, only 130–140 MAP species are cultivated (Verlet and Leclercq 1999).

Materials and methods

During my research scented mayweed (“Hungarian chamomile” - *Matricaria chamomilla*) as an annual plant sown in the autumn, yarrow (*Achillea millefolium*) as a perennial plant sown in the autumn and dill (*Anethum graveolens*) as a spring-sown aromatic/medicinal herb are intended to be tested. By my examinations I wish to find answers how these cultures can be kept free of weeds under field conditions, whether the agents applied can be detected in the plant-based products, and how the certain technological elements can influence the essential oil content of the plants. Accordingly, I systematize the domestic and foreign cultivation practices and weed control technologies. I follow the changes in nutritional composition for the three subject plant cultures with special regard to the quality and quantity of essential oil. The residues of applied pesticides are also intended to be examined.

Expected outcomes

Through the effective application of methods, the following outcomes are expected after having carried out the research:

- Elaboration of a modern, integrated chemical and mechanical weed control technology
- Cultivation technology for 3 plants based on elaborated practical criteria
- Follow-up of changes in nutritional composition with respect to the applied weed control technologies
- Test results of pesticide residues with respect to the applied active substances

My research may have the following additional outcomes:

- Effects of various active substances on the subject medicinal herbs
- Survey of pests and pathogens on the subject medicinal herbs under field conditions
- Effects of environmental factors on the quantity of essential oil

Conclusions

In my consideration the outcomes of my research are of use to the whole Hungarian and European agricultural sector. The environmental protection, the integrated approach and the regulatory environment are all encouraging the growers to use a more diverse crop ratio and to work with more plant cultures than in the traditional system of 4 to 5 plants developed till now, which can provide also financial security for the farmers. The use of an effective cultivation technology may save costs and require less inputs. The latter is one of the main pillars of environmental protection. Hopefully, my results can be of service to the decision makers, crop buyers and end users in addition to the farmers.

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